FOREST INSECT CONDITIONS ON THE SALMON NATIONAL FOREST, 1966

The following is a resume of forest insect activities on the Salmon National Forest this year. This material was gathered from aerial survey data, from special spruce budworm evaluation surveys, and by periodic visits by entomologists to specific problem areas. A map depicting the extent and nature of insect infestations as recorded during the aerial survey is attached.

The primary forest insect problems on the Forest this year are the spruce budworm and pine engraver beetles, Ips spp. Briefly, the heavy spruce budworm activity forecast for 1966 did not materialize, resulting in the cancellation of a planned 120,000 acre spray project. Both intensity and extent of defoliation decreased from that recorded last year. This sudden and unexpected population reduction was probably caused by a sequence of timely and effective subfreezing temperatures last fall and this spring. A slight increase in damage can be expected in 1967 but it will likely be 2 or possibly 3 years before the budworm can build back to its 1965 level. Ips beetles flared up and killed second growth ponderosa pine in and near thinning areas. Slash left in the fall of 1965 did not dry out as expected, consequently the beetles reared aggressive broods which attacked and killed live, green timber. The attacked trees faded too late to be spotted during the aerial survey, consequently they were not entered on the survey map. A more detailed discussion of these insect problems follows:

The spruce budworm, Choristoneura fumiferana (Clem.)

The spruce budworm received a major setback on the Salmon National Forest this year. Predictions made in 1965 forecast continued defoliation on more than 700,000 acres with heavy defoliation and subsequent tree damage expected on more than one third of this total area. Plans for 1966 were to treat 120,000 acres of threatened Douglas-fir timber. Contrary to the early predictions, however, the anticipated heavy budworm populations did not materialize; consequently the proposed spray program was cancelled. On the ground spot checks were made in previously infested areas and elsewhere on the forest but only scattered, light larval populations were detected.

The primary reason for this unexpected population decline is believed to have been unseasonal frosts which occured in the fall of 1965 and spring of 1966. Weather records showed subfreezing temperatures throughout Idaho and elsewhere in the Intermountain Region in the middle of September last year. Practically all weather stations in the mountainous areas of central Idaho reported below freezing minimum daily temperatures for the period September 16 - 19. Salmon, for example, reported minimum temperatures of 28, 18, 18 and 22°F for the four day period. At that time spruce budworm egg hatch was complete at the lower elevations and larvae were established in their overwintering niches - protected and reasonably acclimatized against the forthcoming winter. At higher elevations it is suspected that some mortality did occur. Late hatching larvae may have been caught by subfreezing temperatures before they became acclimatized or were secure in their hibernating sites. A high but unmeasureable incidence of nonhatch of 1965 egg masses collected from selected locations in the forest suggests this possibility.

Additional budworm kill was caused by low temperatures during late spring and early summer of this year. May was unseasonably warm with practically all stations throughout the state reporting above-average temperatures. These warm temperatures hastened both budworm and foliage development at all elevations. By the first week in June, budworm larvae had passed through the needle mining stage and entered the expanding buds or were feeding in the embryonic shoots. On June 4th and 5th, subfreezing temperatures killed the frost-susceptible buds and shoots along with many of the budworm. This late frost would likely have had little effect on the budworm population had it not been for the abnormally warm weather in May. The late frost was indirectly responsible for additional budworm mortality for it undoubtedly deprived many of the surviving larvae of food. The same thing was repeated in late June when both foliage and budworm were considerably more advanced and less able to survive subfreezing temperatures. The second frost hit the state the last week of June. Most of the low elevation weather stations recorded subfreezing temperatures on the 25th and 26th of June. It can be assumed that temperatures at higher elevations were even lower than those at the weather stations.

Both the extent and degree of noticeable spruce budworm defoliation decreased markedly from that recorded last year. A breakdown by damage categories of the total infested acreage this year and last as recorded by aerial surveys follows:

	INFESTATION INTENSITY			
Year	Light	Medium	Heavy	Total
	296,500	77,400	336,000	709,900
	495,700	25,900		521,600

Of greater significance than the overall decrease in infested acreage is the complete lack of heavy feeding damage this year. This respite will permit many weakened trees to at least partially recover from the effects of repeated severe defoliation.

Although more than one half million acres have been classed as damaged by budworm feeding, the actual infested acreage may be somewhat lower. Frost damage on Douglas-fir was so extreme and extensive that, in many areas and under certain light conditions, it was difficult for the aerial observers to separate it from budworm activity; consequently, all discernible foliage discoloration was mapped as spruce budworm damage. Further evidence of light budworm populations is found in the data derived from eggmass collections. The 1966 egg mass counts, comparisons with 1965 counts, and defoliation and trend predictions for 1967 follows:

	Egg Masses/1000 Sq. In. - Expected Defoliation			Trend
	1965 (No.)	1966 (NO.)	1967 (%)	
Agency Creek	23.0	8.9	25-50	Down
Copper Creek		0.4	15	Unknown
Dahlonega Creek	8.9	0.2	15	Down
Derian Creek	23.9	11.3	51-90	Down
Freeman Creek		4.7	15-25	Unknown
Hayden Creek	20.2	4.8	15-25	Down
Indian Creek		0.0		Unknown
Iron Creek (S.F.)		1.0	15	Unknown
Jesse Creek		18.8	90-100	Unknown
McDivitt Creek	22.7	7.1	25-50	Down
Middle Fork Peak		0.6	15	Unknown
Moyer Creek	12.2	0.7	15	Down
Pine Creek		0.1	15	Unknown
Porphyry Creek	2.3	0.0		Down
Rabits Foot	0.9	0.1	15	Static
Spring Creek		0.0		Unknown
Timber Creek	50.3	3.1	15-25	Down
Votler Creek		0.0		Unknown
Williams Creek	9.7	1.7	15	Down

Of the 19 plots sampled, only 10 were sampled last year. In each case, however, significantly fewer egg masses were found this year. Samples were taken inside and outside of known defoliated areas to measure trends in existing infestations and detect budworm presence in others. Barring another unexpected population decline such as happened this year, intensity and extent of defoliation will increase slightly, but with few exceptions damage will be low next year. Heaviest defoliation will occur in and near

the Jesse-Derian Creek drainages. Moderate feeding will occur in and adjacent to Agency and McDivitt Creeks with light to negligible defoliation occurring elsewhere. Experience has shown, however, that this respite from budworm feeding may be only temporary and in a matter of time, 2 to 3 years perhaps, budworm populations will increase again.

Pine engraver beetles, Ips spp.

Regional thinning practices in the ponderosa pine type have precluded any serious Ips buildup until this year. In the past, slash left after mid-July dried out sufficiently during the winter and following spring to be unattractive to attacking beetles. Normally, slash laid in the fall will harbor beetle populations which will overwinter, emerge, and make new attacks in the spring. This generation is usually not a threat to standing green timber - subsequent generations cause the damage. If there is fresh material available in the spring, the overwintering population will first attack the slash, develop through the summer, and emerge to attack standing green trees. In some years, conditions permitting, there will be 3 and possibly even 4 generations. Ordinarily if fresh material is not available in the spring and early summer to support the population, the beetles are unable to sustain themselves in standing, healthy trees.

This year, however, was the exception. Slash deposited last fall did not dry out as expected; consequently, spring broods were produced and they emerged and attacked standing green trees in the summer. The several hundred ponderosa pines killed by Ips in the seed production area in Grouse Creek is an example. The trees were attacked by Ips beetles reared this spring, in slash deposited last fall in the nearby Grouse Gulch and Ransack thinning areas. An examination of these trees this fall showed heavy woodpecker activity within three to seven feet of the ground. In the upper bole, wherever woodpecker work was absent, some Ips had already emerged. In the lower portion of the trees, mature larvae and pupae were present but few in number. Parasites and predators were present in those trees and portions of trees from which adult beetles had emerged, but they were not plentiful enough to significantly affect the population level or trend. Therefore, these broods will overwinter and attack fresh slash if available next spring. There is a possibility that slash resulting from thinning activities this fall will retain sufficient moisture to rear these broods next spring. If this situation occurs, tree killing will continue next summer.

A different situation existed in a ten acre thinning project in lower Vetter Creek. This area was thinned this year in late September. Only a portion of the slash was attacked by Ips. The majority of the brood was in the egg stage indicating relatively recent attacks. If conditions are favorable these broods will mature next summer, emerge, and attack fresh slash if it is available; if not, they may attack standing green trees. Again, if the infested slash does not dry out, it will assure a spring generation, the offspring of which will kill live trees next summer.

These "atypical" situations create a dilemma for the forester who has only two possible alternatives. The first is to follow the policy of postponing thinning and/or logging operations until mid July and risk the possibility of destructive Ips populations breeding in the slash, as happened this year. The other possibility is to log and thin on a year-round basis thereby keeping Ips in the slash rather than the timber, but this would mean eventual burning or chemical treatment of the slash. This second alternative, although biologically sound, may not be feasible. Nonetheless, if we continue to lose green ponderosa pine by Ips, some revision in practices may be necessary.

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